

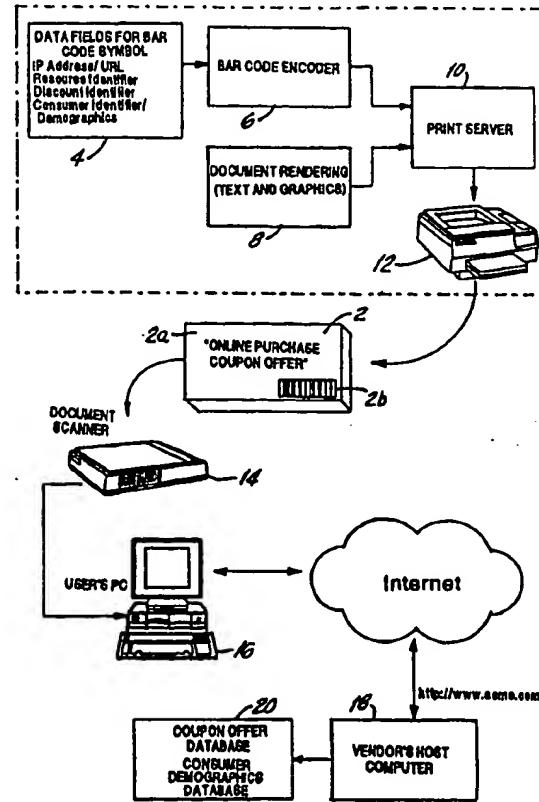
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(54) Title: PRINTED COUPONS WITH EMBEDDED DISCOUNTS FOR ONLINE PURCHASES

(57) Abstract

A method for providing discounts in e-commerce transactions comprising printing a discount coupon (2) with human readable information describing the incentive, product, vendor, and a machine-readable symbol (2b) such as a linear or two-dimensional bar code symbol. The symbol is encoded with data fields comprising a first identifier associated with the Internet Protocol address of a vendor's computer, optionally, a second identifier associated with the discount applied to a product, optionally, a third identifier associated with the targeted consumer, and optionally, instructions to enable a computer to access a client program. The method also comprises the steps of disseminating the discount coupon (2); scanning the machine-readable coupon symbol; decoding the scanned data to generate the vendor's IP address; launching the client program to enable access to the online system; communicating with the vendor's host computer; and downloading a file from the vendor's host computer associated with the scanned coupon (2).



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PRINTED COUPONS WITH EMBEDDED DISCOUNTS FOR ONLINE PURCHASESCROSS-REFERENCE TO RELATED APPLICATIONS

5 This application claims priority of co-pending U.S. application serial number 08/967,383, filed November 8, 1997; and claims priority of co-pending U.S. application serial number 09/023,918, filed on February 13, 1998; and claims priority of co-pending U.S. provisional application serial 10 number 60/052,597, filed on July 15, 1997; all of which are assigned to the assignee of the present application and incorporated by reference herein.

TECHNICAL FIELD

15 The present application relates to online commerce, and in particular to the use of printed coupons having purchase discounts embedded in machine-readable symbols such as bar codes that enable a user to obtain discounts for online purchases.

20

BACKGROUND ART

25 Online commerce, in particular so called electronic commerce or "e-commerce", has promulgated due to the increased use of open online systems such as the Internet, as well as proprietary online systems such as AMERICA ONLINE and COMPUSERVE. E-Commerce may be considered to be a method of executing a transaction by enabling two computers to exchange certain information such that a vendor will receive value in the form of payment, and the purchaser will, in exchange, receive value in the form of products or services. Thus, for example, a typical e-commerce transaction on the Internet would involve a consumer accessing a vendor's server computer

would involve a consumer accessing a vendor's server computer through his World Wide Web browser, and downloading a page from that server that offers a lamp for twenty dollars. The consumer could purchase the lamp by entering his credit card 5 information (optionally in a secure manner such as through encryption) into his browser and transmitting the information to the vendor's server by the Internet. The server computer would validate the transaction by clearing the credit card number with a central clearinghouse, and after receiving 10 approval for payment, arrange to have the lamp shipped to the consumer. As in a direct mail purchase scenario, the consumer receives the lamp in due course and is billed on his credit card, and the vendor receives payment from the credit card company for the transaction. Of course, there are numerous 15 ways to execute payment for the goods and services that offer various degrees of security and ease of use, but the paradigm of electronic goods selection and payment remains constant for any such type of payment methodology.

20 The above scenario has become popular for the increased convenience and lower cost it provides for both the consumer as well as the vendors. Any consumer having access to the Internet could use the system, and any vendor having access to the Internet can make his goods or services 25 available for purchase. This scenario does not allow, however, for the use of a purchase incentive system such as coupons that are prevalent in marketing today. That is, the coupon system, that gives certain consumers discounts for 30 select products at the point of purchase, is not provided for in the e-commerce system. Although a vendor could provide discounts to online purchasers at the point of sale (i.e after he has logged on to the site), there exists no method of

providing coupon-type incentives to consumers to go online and actually initiate the online transaction to receive the discount for the online purchase.

5 It is therefore an object of the invention to provide a system that allows vendors to provide purchase incentives such as coupons to users to entice them to access a vendor's Internet site and execute an online transaction.

10 It is also an object of the invention to provide a system that allows the dissemination of traditional printed coupons that could be linked to incentives for online purchases.

15 It is a further object of the present invention to provide such a system that allows for targeted couponing such that certain targeted consumers would receive a first type of purchase discount, and certain other targeted consumers would receive a different type of purchase discount.

20

DISCLOSURE OF THE INVENTION

The present invention is a method for providing purchase incentives or discounts in an online e-commerce transaction comprising the steps of printing a discount coupon, the coupon comprising human readable information describing at least part of the incentive or offer, product information, vendor information, or the like, and a machine-readable symbol such as a linear or two-dimensional bar code symbol. The symbol is encoded with data fields comprising a first identifier associated with the Internet Protocol address of a vendor's host computer, optionally, a second identifier associated with a discount amount to be applied to a product

or group of products, optionally, a third identifier associated with the consumer for whom the discount coupon has been targeted, and optionally, an instruction for a computer to launch a client program enabling access to the online system, such as a World Wide Web browser program. The method 5 also comprises the steps of disseminating the discount coupon to a targeted consumer or group of consumers, or optionally to the public in general; scanning the machine-readable coupon symbol at the consumer's computer; decoding the scanned data 10 to generate the vendor's IP address; launching the client program to enable access to the online system; communicating with the vendor's host computer by utilizing the decoded IP address; and downloading a file from the vendor's host computer associated with the scanned coupon, the file 15 containing information relating to the discount to be applied to enable the user to make a purchase decision. If the user elects to make an online purchase, then said election is communicated to the vendor's computer, the discount related to the coupon is applied and a payment and delivery process is 20 executed to enable the vendor to collect the purchase price and the user to obtain the purchased product.

BRIEF DESCRIPTION OF THE DRAWINGS

25 These and other objects and features of the invention will be described in relation to the drawings.

Figure 1 is a block diagram of the system of the present invention;

30 Figure 2 is a flowchart of the coupon generation process; and

Figure 3 is a flowchart of the coupon scanning and online redemption process.

BEST MODE FOR CARRYING OUT THE INVENTION

5 The preferred embodiment of the present invention will now be described in detail with reference to the Figures. The dotted line portion ("Online Coupon generation") relates to the generating and printing of e-commerce coupons 2 that will be useful for scanning and providing a discount for an
10 online e-commerce transaction. The coupon is comprised of two portions; a human-readable portion 2a and a machine-readable portion 2b such as a bar code symbol. The human-readable portion contains information such as text and/or graphics that typically are found on a coupon or other type of incentive or
15 advertisement such as the vendor's name, product information, etc. The coupon 2 should also inform the user that the scanning of the bar code on his computer will enable a discount for an online purchase. The discount amount may be shown, or it optionally may be not shown so that the user is
20 enticed to go online in order to learn the discount amount at the online "point-of purchase".

25 The machine-readable portion 2b would typically be a linear or two-dimensional bar code such as a PDF417 bar code, which is well known in the art. Of course, any bar code having enough information density to be encoded with the required information, and potentially the optional information to be described herein, can be used within the spirit and scope of the present invention. In addition, other types of
30 machine-readable symbols or tokens may be used as well.

The bar code symbol is encoded with various fields of information, depending on the mode utilized by the vendor printing the coupon. The data fields 4 that may be encoded into the bar code symbol are described as follows:

5

1. Vendor IP address - The Internet Protocol (IP) address is encoded in order to enable the user's computer to access automatically the vendor's host computer. The IP address may be directly encoded in IP protocol (aa.bb.cc.dd format), or the URL of the vendor may be used (http://www.company.com), which must be resolved into the IP address by the Internet Domain Name system as well known in the art.

15

Referring to co-pending U.S. patent application serial no. 08/967,383, which is incorporated by reference herein, a two-dimensional bar code such as a PDF417 bar code symbol may be used to advantageously encode a relatively large amount of data, including the URL of the target vendor as well as the resource identifier that indicates to the vendor's server computer the identity of the resource (i.e. product offer) to be utilized, demographic information related to the user to whom the coupon offer as been targeted, and an optional encryption key that may be used by the client (user) computer to encode his credit card number for use in executing the online transaction. A targeted discount amount may also be included so that different users can be provided with different discounts or other types of incentives.

25

30 The inclusion in the bar code symbol of an encryption key is especially useful in this embodiment, since it allows the user to encrypt sensitive information such as

his credit card number, and then transmit it with the http request for the product offer over the Internet. Since the vendor knows the encryption key that the user has used (either because the vendor distributes only one such key or because he 5 can look up the key locally or remotely by using the associated demographic information received with the http request), he can easily decrypt the credit card number (or other sensitive information such as a bank account number) to complete the transaction. The user can thus complete a 10 sensitive purchase transaction over the Internet without fear of sensitive information being misappropriated by an unscrupulous eavesdropper.

U.S. patent application serial no. 09/023,918, which 15 is also incorporated by reference herein, discloses an alternative mode of embedding vendor computer location information into the target bar code. As taught therein, the IP address itself (in well known "aa.bb.cc.dd" format) may be encoded within the bar code so as to avoid the need to utilize 20 the domain name system for looking up the IP address from the mnemonic (such as www.acme.com). In this case, the target file ID or pointer may also be encoded within the bar code so as to enable the user to download the proper resource (file) from the vendor server computer located at the encoded IP 25 address. The use of this type of encoding also allows the use of a smaller bar code, such as a linear or one-dimensional bar code. The use of a linear bar code enables a simpler type of bar code scanner to be utilized by the consumer than in the previous case of the two-dimensional bar code.

30

In another alternative, a pointer or resource code may be encoded, that can be used by the user's computer to

5 resolve (i.e. look-up) the URL at a local or remote database configured to provide such information. Thus, the word "acme" may be encoded in the bar code, and the user's computer could perform a look-up (remotely or locally) to obtain the URL or
10 IP address associated with that identifier. The use of a shorthand identifier is particularly useful when trying to pack the data fields into a small symbol such as a linear bar code. In particular, published international patent application No. PCT/US97/10689 (WORLD WIDE WEB BAR CODE ACCESS SYSTEM), which is incorporated by reference herein, discloses such a system that implements the use of a resource link code embedded in a bar code, that can be scanned and used to fetch an associated URL from an external or internal database of URLs.

15

10 Alternatively, use may be made of existing bar codes such as UPCs (Uniform Product Codes), that already exist on products as well as printed coupons. The UPC may be scanned, and an external look-up table or database may be accessed to
20 determine the URL or IP address of the target vendor computer on the Internet. The URL is returned by the database to the user's computer, and is then used in the normal course of operation to access the appropriate computer. In addition, the two constituent portions of the UPC (the manufacturer code
25 and the item code) may be used in the same fashion. That is, the user's computer may strip the manufacturer's code from the scanned UPC, and send it to the external database computer to look-up the appropriate URL for that coupon. The URL is returned to the user's computer, where it is then combined
30 with the item code portion of the decoded UPC to generate a URL or http request accordingly. This is then sent to the appropriate vendor's computer and the online transaction may

proceed accordingly. For this embodiment, reference is made to published PCT patent application No. PCT/US96/10592 (SYSTEM FOR USING ARTICLE OF COMMERCE TO ACCESS REMOTE COMPUTER), which is incorporated by reference herein. In this 5 embodiment, it is envisioned that the user can purchase a product such as a music CD, scan the UPC already on the CD, and be provided with a Web page that allows him to purchase another (maybe related) CD at a discount, if he consummates the purchase online. Thus, the incentive provided by the 10 instant invention is realized by simply scanning the product itself rather than a separate coupon.

In yet another embodiment, the entry of a keyword or alias onto a keyboard may be used to effect a discount for an 15 online purchase, without the need to actually scan a coupon or product. That is, an alias or nickname is entered into the user's computer, and is used to look-up the URL or IP address as mentioned above. Thus, the entry of a predetermined alias such as "CD_Discount" would return the URL of a special Web 20 page that offers to the consumer the purchase of a CD at a discount online. The particular discount can be modified on a page by page basis, that would be accessed with different keywords or different look-up maps at different times. By 25 using this embodiment, a vendor could print an ad that instructs the user to type in the alias on a certain day only, and that he will be provided with a discount on that day only for the online purchase. The instant invention is thus realized without the need to have a scanner at the user's computer; typing in the appropriate keyword suffices to 30 provide the instant discount for the online transaction. For this reference is made to U.S. Patent No. 5,7604,906, which is incorporated by reference herein.

2. Incentive and/or product resource identifier - An identifier that designates the file location on the vendor's host computer that will provide the product and/or incentive (discount) information to the user. This may be encoded as part of the URL (<http://www.company.com/couponpromo.html>) above, or it may be a separate field. The resource identifier is optional, since the default resource location (e.g. `index.html`) that the Web browser uses when one is not specified may be used by the vendor to carry the purchase information.

3. Discount identifier - The vendor may include a discount amount (percentage or absolute amount) in the bar code. This is useful in the situation where different discounts will be targeted to different groups of consumers, such as when current customers are given discounts of 10% but new potential customers are given discounts of 20%. The intelligence to apply different discounts may also reside at the server, which could take demographic information and use it to determine the discount.

4. Consumer identifier - The bar code may include data that is specific to a targeted consumer or group of consumers. Thus, for example, bar codes may be printed utilizing a database of specific consumers, so that John Smith's targeted coupon has encoded therein an identifier to inform the vendor's server that John Smith has utilized the coupon (this may be a look-up pointer or the like). This enables the vendor to track coupon redemption for future targeted mailings. Note that consumer identification may also be

uploaded to the vendor by extracting information resident on the user's computer.

5. Client application launch command - Optionally, the
5 bar code could be encoded with a command to automatically
launch a client application such as a web browser, so that the
online purchase process is automated to a greater extent.
Thus, for example, in a WINDOWS environment, the user would
simply scan the coupon's bar code while in any application (or
10 just at the Windows Desktop), and the Web browser application
launch command would be decoded and cause the Web browser
resident on the user's computer to execute (and if necessary
dial-up the Internet Service Provider preprogrammed by the
user). If this option is omitted, then the user would have to
15 invoke his Web browser in the usual fashion.

The information described above is input into a bar
code generation program 6 suitable for encoding the input
20 fields into a print stream suitable for printing the desired
bar code symbol. This process is well known in the art and
need not be described in detail. In addition, optional
parameters related to the specific symbology utilized by the
invention may be selected at this stage. For example, the
25 PDF417 symbology provides a redundancy-type security feature
that protects against non-decodes of partially damaged
symbols. This feature could be utilized by the entity
printing the bar codes to promote a robust utilization of the
couponing system of this invention.

30

In addition to the bar code print data stream that
is generated, a print stream is also generated by document

rendering process 8 that will provide the rendering of the remainder of the printed coupon; i.e. the human-readable portion. This is also a process that is well known in the art, and need not be described in detail here. For example,
5 the coupon would likely include a graphic representation of the discounted product, a textual invitation to scan the coupon for an online purchase, an indication of the discount amount, etc.

10 The bar code print stream and the coupon rendering print steam are then input to a print server 10 and/or printer 12 as well known in the art, which will produce the desired online coupon 2 of the present invention. The coupons are disseminated to the public in general, or to a specifically
15 targeted group of users, in any way desired. Thus, the coupons may be included in a direct mail program, included as inserts in the newspapers or magazines, etc. The coupon may also be printed as part of an advertisement or brochure, magazine, instruction manual included with a product (e.g. a
20 purchaser of a video game software package could receive a coupon for an online purchase of a joystick), etc.

Once the user has received the online coupon and wishes to make a purchase with it, he must scan the coupon
25 with a bar code scanner means coupled to his computer. This could be by the use of a dedicated bar code scanner such as a laser scanning device (such as one of a variety of devices marketed by Symbol Technologies, Inc.) or an equivalent CCD scanning device. In the preferred embodiment, a general-purpose document page scanner 14 (such as any of a variety of such device marketed by Hewlett-Packard) may be used by the
30 present invention. The scanning device provides an electrical

signal that is proportional to the bars and spaces of the scanned bar code symbol, and a decoder program running on the computer 16 (or embedded in the dedicated scanner) examines the patterns of bars and spaces to arrive at the original data 5 encoded by vendor at the coupon generation stage described above. The scanning and decoding processes are well known in the art and need not be described in detail here.

10 The actions taken next depend on the data that has been decoded from the bar code symbol. If the Web browser launch command has been included, then the user's Web browser is invoked, or else the user must manually invoke the browser by a point-and-click action well known in the art. Once the user's computer is connected to the Internet, the IP address 15 decoded from the bar code symbol is used to access the vendor's server computer. Of course, if only a URL had been included, then the browser must first invoke the Domain Name Resolution process as well known in the art in order to obtain the correct IP address of the vendor. Similarly, if only a 20 pointer or resource code had been encoded, that is then used by the user's computer to resolve (i.e. look-up) the URL at a local or remote database configured to provide such information.

25 Once the vendor's host server computer has been accessed, the resource associated with the coupon is downloaded to the user's browser in a manner well known in the art. The user can view the information regarding the item or items available for purchase, as well as the pricing and 30 discount or other information, and make his purchase choice based on this data. If the user decides to purchase the item, he will be provided with the discount and make payment in one

of any number of Internet payment systems, or by any conventional such as C.O.D., telephone call with a credit card number, etc. All that is required is that the user is provided with a discount on the purchase price due to his use
5 of the online coupon.

The discount amount may be obtained directly from a data packet transmitted with the user's HTTP request to access the vendor's file. That is, the discount amount may be
10 obtained directly from the coupon, which is useful when the vendor desires to provide different discount amounts to differently targeted users. If all discounts are to be the same, then that intelligence may be kept on the vendor's sever. In this case, the vendor would be provided with some
15 type of identifier from the scanned coupon that indicates the discount should be applied. In the alternative, the resource obtained by the user by scanning the coupon may be available only through a password embedded in the coupon, such that only targeted users will be able to access that Web page. Many
20 ways of providing a discount amount are thus envisioned by the present invention.

Of particular value to the vendor in the present invention is the collection of demographic data regarding
25 coupon redemption and usage. Thus, it is desired that information regarding the identity of the user be provided to the vendor's server during the transaction. As explained above, some or all of the demographic information (e.g. name, age, sex, address, hobbies, occupation, income level, etc.)
30 could be included with the data encoded into the bar code, if such information is available to the vendor beforehand. In this case, the vendor might have a database of potential

users, each of whom would be targeted with the online coupons. The vendor could then make intelligent decisions regarding future coupon targeting, since it will know (1) who was sent the coupons, (2) who accessed the purchase offer online, and 5 (3) who actually made the purchase. In the alternative to including the demographics in the bar code, a consumer ID may be included, which can be linked by the vendor in its database to obtain the above redemption information.

10 If non-targeted mailings are implemented (i.e. where everyone is provided with the same bar code coupon), then the vendor will likely want to obtain some demographic information from the user upon consummation of the online purchase. Thus, the vendor would require a form to be filled out by the user, 15 which would be sent to the vendor for inclusion in its database and use in later mailings.

20 A detailed example will help explain the present invention. The Acme Software Company runs a Web site at <http://www.acmesoft.com>, and in particular provides a special offer to registered users of its SpreadSheet software that would allow it to obtain its DataBase software by an online purchase at a discounted price. If the user had indicated in its SpreadSheet registration form that it uses a competitive 25 brand of database software, then it applies a \$20 discount, and if the user had indicated in its SpreadSheet registration form that it never used any type of database software, then it applies only a \$10 discount. Acme prints a coupon for mailing to these registered SpreadSheet users that will receive the 30 \$20 discount that includes the following fields:

IP ADDRESS	RESOURCE ID	DISCOUNT	CONSUMER ID
http://www.acmesoft.com	/databaseoffer.html	20	12345

5 John Smith, a registered user with Acme consumer ID
number 12345, receives this coupon in the mail and is enticed
into purchasing the DataBase software package by reading the
accompanying text offer. He passes the coupon under his page
scanner attached to his computer, and a bar code decoding
10 program is automatically invoked. He then dials-up his
Internet Service Provider (this example does not include the
launch command), and the page
"http://www.acmesoft.com/databaseoffer.html" is loaded by his
browser. After reading the enticing offer on the screen, he
15 clicks on a "purchase" button and provides his credit card
number in an encrypted format. He receives the software at
the normal price minus the discount of \$20.

20 In this process, Acme is provided with his consumer
ID to verify that this consumer should in fact be receiving
the discount. Acme also know has knowledge that Mr. Smith
received the offer, acted on it, and executed it. Acme may
then utilize this data in future coupon campaigns.

25

CLAIMS

1. In an internetworked computer system comprising at least one user computer and at least one vendor computer connected thereto, a method for providing purchase discounts in an online transaction between a user computer and a vendor computer comprising the steps of:
 - a) printing a discount coupon, the coupon comprising printed indicia associated with the network address of the vendor computer,
 - b) disseminating the discount coupon to a user;
 - c) inputting the indicia to the user computer;
 - d) processing the indicia input to the user computer to determine the network address of the vendor computer;
 - e) communicating with the vendor computer by utilizing the determined network address;
 - f) downloading from the vendor computer to the user computer a file associated with the input indicia, the file containing information relating to the discount to be applied to an online transaction to enable the user to make a purchase decision.
2. The method of claim 1 wherein said printed indicia comprises human readable information.
3. The method of claim 2 wherein said human readable information comprises information that describes at least part of the transaction discount offer.

30

4. The method of claim 2 wherein said human readable information comprises an alias associated with the network address of the vendor computer.
5. The method of claim 4 wherein said step of inputting the indicia comprises typing said alias on a keyboard of said computer.
6. The method of claim 5 wherein said step of processing the indicia input to the user computer comprises the step of looking up the vendor computer network address in a database table, said network address being correlated to said alias.
- 15 7. The method of claim 1 wherein said printed indicia comprises a machine readable code.
8. The method of claim 7 wherein said machine readable code is a two-dimensional bar code symbol.
- 20 9. The method of claim 8 wherein said two-dimensional bar code symbol is encoded with the URL of the vendor computer.
- 25 10. The method of claim 8 wherein said two-dimensional bar code symbol comprises information specific to the user.
- 30 11. The method of claim 8 wherein said two-dimensional bar code symbol comprises an encryption key sufficient to enable the user to encrypt sensitive

information useful for inclusion with the online transaction.

12. The method of claim 7 wherein said machine readable code is a linear bar code symbol.
13. The method of claim 12 wherein said linear bar code symbol comprises the IP address of the vendor computer.
14. The method of claim 13 wherein said linear bar code further comprises an identifier associated with a resource to be obtained from the vendor computer, the resource containing information relevant to the online transaction discount.
15. The method of claim 7 wherein said machine readable code comprises a resource pointer, said resource pointer associated with a network address of said vendor computer.
16. The method of claim 15 wherein said step of processing the indicia input to the user computer comprises the step of looking up the vendor computer network address in a database table, said network address being correlated to said resource pointer.
17. The method of claim 12 wherein said linear bar code symbol is a UPC symbol comprising a manufacturer identification field and a product identification field.

discount related to the coupon is applied to the transaction.

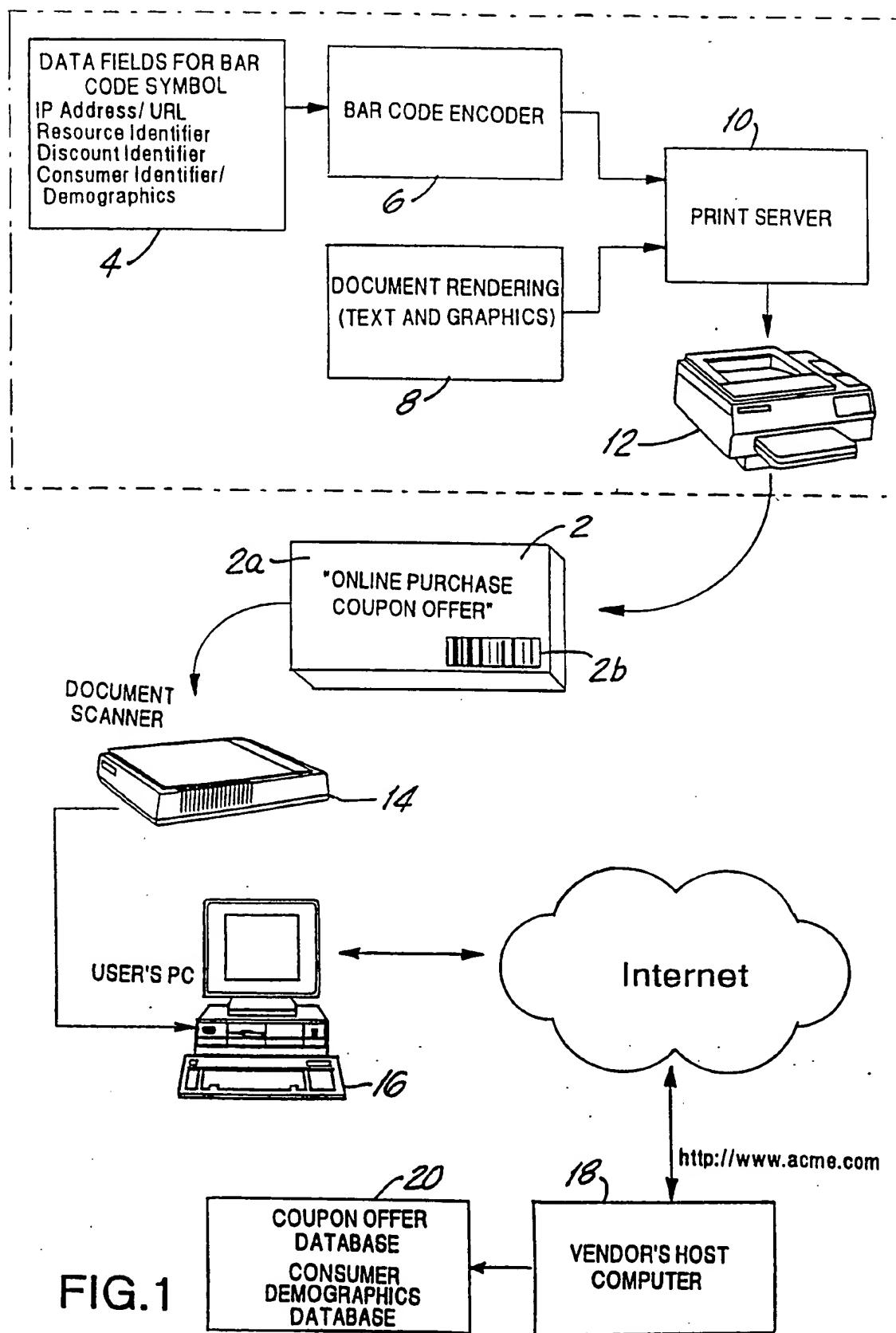


FIG.1

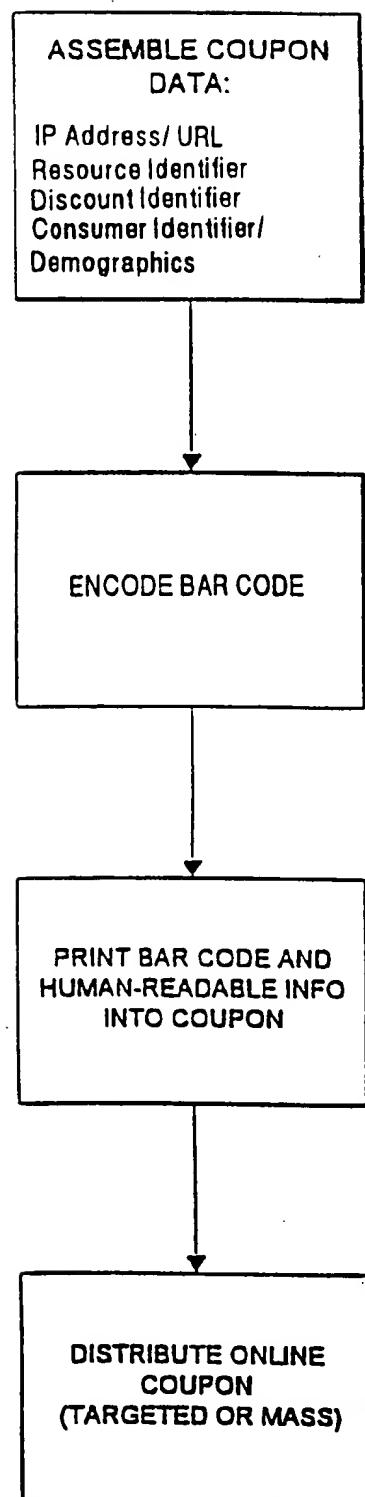


FIG.2

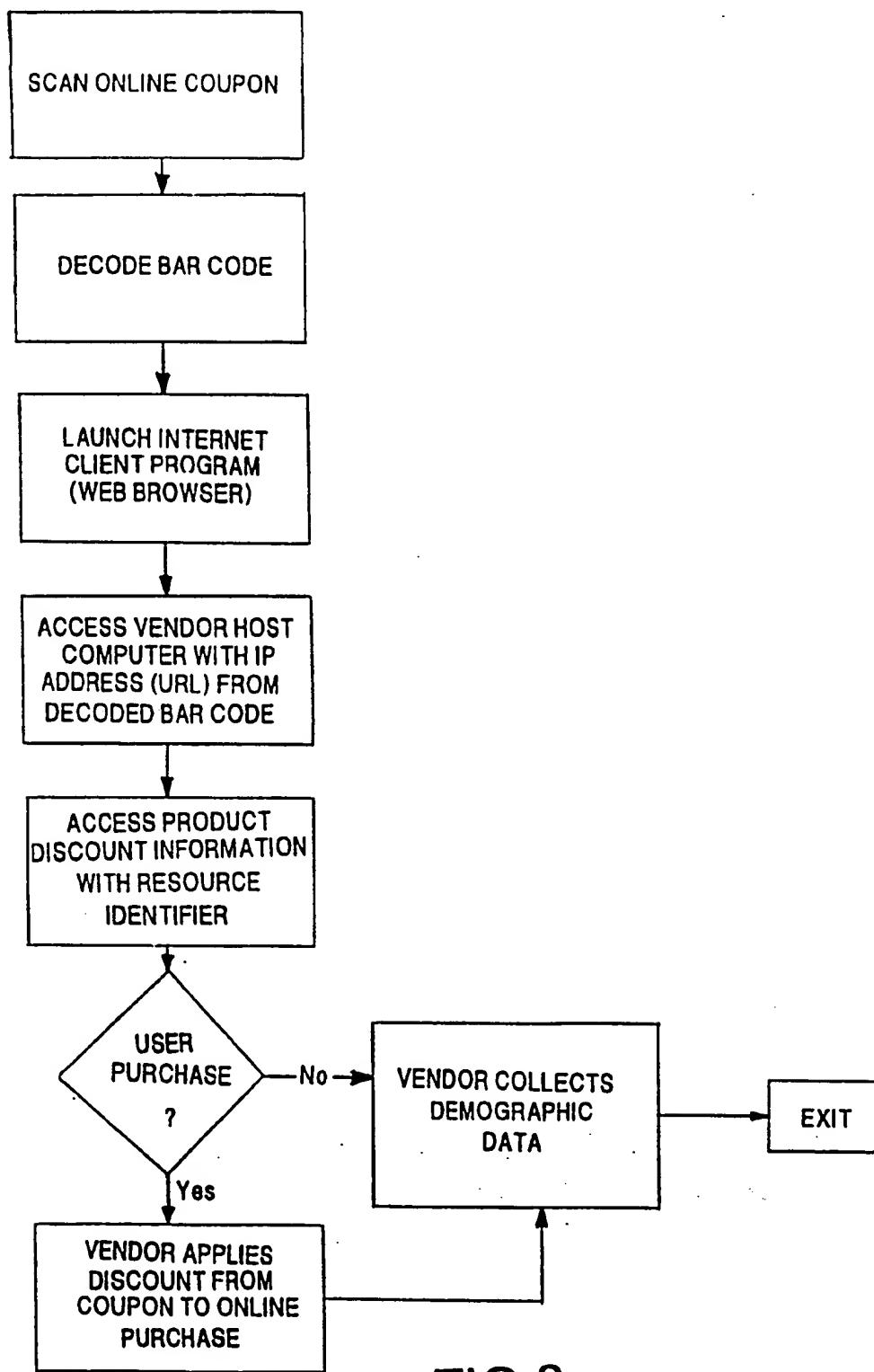


FIG.3



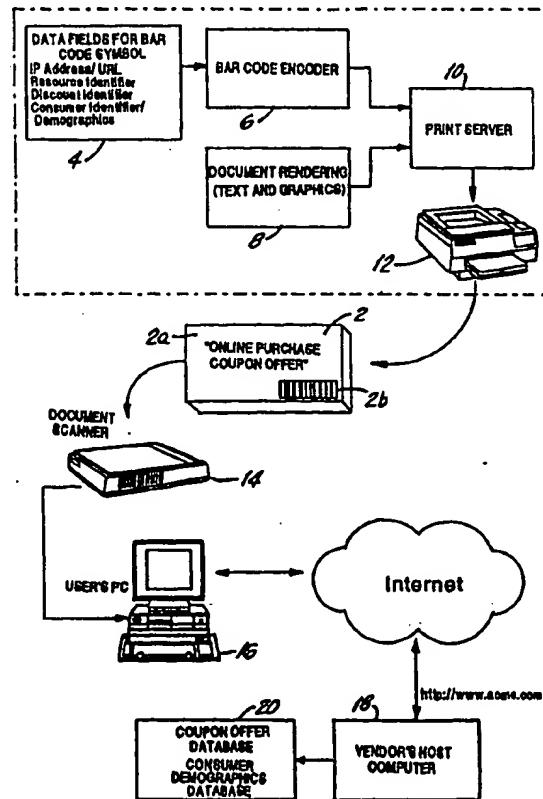
INTERNATIONAL APPLICATION PUBLISHED UNDER THE PATENT COOPERATION TREATY (PCT)

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(54) Title: PRINTED COUPONS WITH EMBEDDED DISCOUNTS FOR ONLINE PURCHASES

(57) Abstract

A method for providing discounts in e-commerce transactions comprising printing a discount coupon (2) with human readable information describing the incentive, product, vendor, and a machine-readable symbol (2b) such as a linear or two-dimensional bar code symbol. The symbol is encoded with data fields comprising a first identifier associated with the Internet Protocol address of a vendor's computer, optionally, a second identifier associated with the discount applied to a product, optionally, a third identifier associated with the targeted consumer, and optionally, instructions to enable a computer to access a client program. The method also comprises the steps of disseminating the discount coupon (2); scanning the machine-readable coupon symbol; decoding the scanned data to generate the vendor's IP address; launching the client program to enable access to the online system; communicating with the vendor's host computer; and downloading a file from the vendor's host computer associated with the scanned coupon (2).



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INTERNATIONAL SEARCH REPORT

International application No.
PCT/US98/14540

A. CLASSIFICATION OF SUBJECT MATTER

IPC(6) :G06F 15/21, 17/40, 17/60, 151/00, 13/00; A63F 3/06; H04L 9/00; G09G 3/02
US CL :Please See Extra Sheet.

According to International Patent Classification (IPC) or to both national classification and IPC

B. FIELDS SEARCHED

Minimum documentation searched (classification system followed by classification symbols)

U.S. : 380/25; 705/10, 14; 395/148,200.3, 200.43; 200.79, 201, 214, 762, 774; 463/40, 41, 42; 364/401,410

Documentation searched other than minimum documentation to the extent that such documents are included in the fields searched

Electronic data base consulted during the international search (name of data base and, where practicable, search terms used)

APS

C. DOCUMENTS CONSIDERED TO BE RELEVANT

Category*	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
Y	US 5,557,721 A (FITE et al.) 17 September 1996, abstract, col. 1, lines 10-23, col. 1, lines 45-67, col. 2, lines 1-67, col. 11, lines 62-67, and col. 12, lines 1-33	1-24
Y	US 5,502,636 A (CLARKE) 26 March 1996, abstract, col. 1, lines 30-50, col. 2, lines 5-67, col. 3, lines 1-67, col. 4, lines 1-38, and figure 1.	1-24
Y	US 5,353,218 A (DE LAPA ET AL.) 04 October 1994, Abstract, col. 3, lines 14-67, col. 21, lines 10-40, col. 22, lines 4-19, and figure 7b.	1-3, 7-8, and 12

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INTERNATIONAL SEARCH REPORT

International application No.
PCT/US98/14540

C (Continuation). DOCUMENTS CONSIDERED TO BE RELEVANT		
Category*	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
Y	US 5,420,606 A (BEGUM et al.) 30 May 1995, abstract, col. 2, lines 5-67, col. 3, lines 1-55, and figure 3	1-24
Y,P	US 5,671,282 A (WOLFF ET AL.) 23 September 1997, abstract, col. 4, lines 16-34, col. 5, lines 4-63, and figure 1.	1-2 and 7-13
Y,E	US 5,806,044 A (POWELL) 08 September 1998, abstract, col. 2, lines 44 to col.3, lines 51, col 15, lines 46 to col. 20, lines 20, and figure 9.	1-24
Y,P	US 5,710,886 A (CHRISTENSEN et al.) 20 January 1998, abstract, col. 4, lines 15-63, and figure 2.	1-24
Y,P	US 5,757,917 A (ROSE et al.) 26 May 1998, abstract, col. 2, lines 14-16, col. 13, lines 5-35, and figure 1.	7-10 and 18-24

INTERNATIONAL SEARCH REPORT

International application No.
PCT/US98/14540

A. CLASSIFICATION OF SUBJECT MATTER:
US CL :

380/25; 705/10, 14; 395/148, 200.3, 200.43, 200.79, 201, 214, 762, 774; 463/40, 41, 42; 364/401, 410; 345/156

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